



Australian Government

Department of the Environment, Water, Heritage and the Arts

Referral of proposed action

**Oakajee Deepwater Port Facility -
Terrestrial Port Development**

Oakajee, Western Australia



Project title:
**Terrestrial Port Development
Oakajee Deepwater Port Facility, Western Australia**

1 Summary of proposed action

1.1 Short description

Oakajee Port and Rail Pty Ltd (OPR) is proposing to construct the Oakajee Port and Rail Project (the Project), a 45 Mtpa Deepwater Port and 570 km rail development. The subject of this referral is the OPR Terrestrial Port Development which encompasses the terrestrial facilities proposed for the port development including the internal port rail system, operations desalination plant, power station, access and service corridors, car dumper, stockpiles, ore in-loading and out-loading infrastructure, and additional ancillary facilities. The OPR Terrestrial Port Development (the Proposed Action) is located within the Oakajee Industrial Estate (OIE), approximately 25 km north of Geraldton (Figure 1).

1.2 **Latitude and longitude**

location point	Latitude			Longitude		
	degrees	minutes	seconds	degrees	minutes	seconds
	-28	35	11.8314	114	35	1.464
	-28	35	24.54	114	34	23.7874
	-28	35	21.516	114	33	18.6834
	28	35	42.072	114	33	16.2714
	-28	36	1.44	114	34	1.02
	-28	35	40.8834	114	35	12.9834
	28	35	58.416	114	35	20.8314
	-28	36	17.1354	114	35	35.3394
	-28	36	25.6314	114	35	35.3394
	28	36	39.528	114	35	47.4354
	-28	36	44.964	114	35	49.8474
	-28	36	58.2834	114	35	49.2354
	28	37	14.5914	114	35	58.308
	-28	37	24.2754	114	36	6.7674
	-28	38	7.8	114	36	15.264
	28	38	22.308	114	36	18.8634
	-28	38	34.404	114	36	15.264
	-28	38	44.0874	114	36	21.888
	28	38	44.6994	114	38	4.704
	-28	38	19.284	114	39	29.952
	-28	34	44.6154	114	39	5.1834
	28	32	36.4194	114	36	42.48
	-28	32	6.7914	114	35	48.048
	-28	33	3.024	114	33	49.536
	28	33	8.496	114	33	51.948
	-28	33	15.12	114	33	48.3114
	-28	33	30.2394	114	33	56.16
	28	33	35.712	114	33	56.772
	-28	33	39.924	114	34	4.004
	-28	33	50.2194	114	34	8.256
	28	34	5.3394	114	34	17.3274
	-28	34	11.964	114	34	16.7154
	-28	34	42.8154	114	34	32.448
	28	34	50.088	114	34	47.568
	-28	34	57.3234	114	34	54.84
	-28	35	3.984	114	35	0.276

1.3 **Locality and property description**

The proposed Action is located within the OIE, approximately 25 km north of Geraldton (Figure 1). The OIE is bounded by the Oakajee River to the north, the Buller River to the south, the North West Coastal Highway to the east and the Indian Ocean to the West. All infrastructure associated with the proposed Action will be located within the OIE and its industrial buffer with the exception of the brine discharge piping of the desalination plant. The desalination brine discharge piping shall be located on the Oakajee Deepwater Port (ODP) southern port breakwater, approximately 800 - 950 m from the shoreline.

1.4 **Size of the development footprint or work area (hectares)**

The proposed Action will have a footprint of approximately 324 ha. Within this footprint, approximately 212 ha of vegetation of varying condition is required to be cleared. The majority of land within the footprint has previously been cleared for agricultural activities. The desalination plant is located within the footprint of the ODP (approved for 170 ha under MS469).

1.5 **Street address of the site**

North West Coastal Highway, Oakajee, WA.

1.6 **Lot description**

The OIE and surrounding buffer zone has been acquired in freehold by the State Government as part of its long term strategic planning process. This area totals approximately 6,400 ha.

1.7 **Local Government Area and Council contact (if known)**

The proposed development site is located within the Shire of Chapman Valley

Shire of Chapman Valley
Lot 7 Chapman Valley Road
Nabawa WA
Ph: 9920 5011
President: Cr John Collingwood
Chief Executive Officer: Mr Dirk Sellenger
Manager Planning and Development: Mr Simon Lancaster

1.8 **Time frame**

Table 1 presents a summary of the approximate development schedule for the proposed Action.

Table 1 Proposed Action approximate development schedule

Activity	Timeframe
Commence Construction	Q4 2011
Bulk Earthworks	Early 2012
Commissioning	Mid 2014
Demobilisation and Final Rehabilitation Rehabilitation of excess disturbed areas will have been commenced within 12 months of construction completion. Rehabilitation will occur progressively.	Early 2015

1.9	Alternatives to proposed action	X	No
			Yes, you must also complete section 2.2
1.10	Alternative time frames etc	X	No
			Yes, you must also complete Section 2.3.
1.12	State assessment		No
		X	Yes, you must also complete Section 2.4
1.12	Component of larger action		No
		X	Yes, you must also complete Section 2.6
1.13	Related actions/proposals		No
		X	Yes, provide details: The proposed Action will service the previously referred OPR Rail Development (2010/5500) and the previously referred ODP (2010/5760) associated with iron-ore mining operations in the Mid-West region of Western Australia.
1.14	Australian Government funding	X	No However, Australian Government funding has been provided for the Common User Infrastructure (CUI) facilities at the Port.
			Yes, provide details:
1.15	Great Barrier Reef Marine Park	X	No
			Yes, you must also complete Section 3.1 (h), 3.2 (e)

2 Detailed description of proposed action

2.1 Description of proposed action

OPR is proposing to construct a 45 Mtpa Deepwater Port and 570 km rail development. The subject of this referral is the OPR Terrestrial Port Development which encompasses the infrastructure associated with the transfer of iron ore from the OPR Rail Development to the ODP.

The OPR Terrestrial Port Development (the proposed Action) forms the terrestrial port component of the Project. The key components of the proposed Action include the rail handling facilities (at the terminus of the mid-west rail), the ore handling system, stockpile facilities, operations desalination plant, power station, workshops, administration buildings, access roads, service corridors and other ancillary facilities (Figure 2). Table 2 below describes the key components of the proposed Action in further detail.

The proposed Action is located within the OIE, approximately 25 km north of Geraldton. The OIE is bounded by the Oakajee River to the north, the Buller River to the south, the North West Coastal Highway to the east and the Indian Ocean to the West.

The OIE has been divided into three areas, each with different permitted land uses and development controls. Development of the OIE is being managed by LandCorp, the corporatized government land body responsible for State initiated land development. The OIE comprises areas for General Industry (Area A), Coastal facilities (including the port) (Area B) and Strategic Industry (Area C) (Figure 3).

The proposed Action will be located primarily within Area B (Coastal facilities) of the OIE with some of the rail handling facilities and supporting infrastructure extending into Area C (Strategic Industry). All infrastructure associated with the proposed Action will be located within the OIE and its industrial buffer with the exception of the brine discharge pipe of the desalination plant. The brine discharge piping shall be located on the ODP southern port breakwater, approximately 800 – 950 m from the shoreline.

The proposed Action will have a total footprint of approximately 324 ha. Within this footprint, approximately 212 ha of vegetation of varying condition is required to be cleared. The majority of land within the Proposed Action footprint has previously been cleared for agricultural activities.

Table 2 Key components of the Project

Non-spatial elements	Description	
Project Life	In excess of 50 years	
Desalination Plant	Rated to treat a peak capacity of 14 ML/day - Approximately 5GL per annum.	
Transport of Product	Rail to Port, Port to Rail.	
Power Station	30 MW per annum diesel or gas fired power station.	
Hours of operation	24 hours a day, 7 days a week, 365 days a year	
Spatial elements	Description	Footprint
Total area of disturbance	Up to 324 ha within the proposed Action area.	324 ha
Total Area of native vegetation clearing	This area is included within total area of disturbance above.	212 ha
Rail facilities	Rail formation and alignment, rail yard and service maintenance workshops	Included above
Iron ore stockpiles and materials handling	Including rail inside port zone, lump rescreening plant, stackers, reclaimers, stockyard, ship loader, and other ancillary facilities.	Included above
Utilities and other infrastructure	Other utilities including power, water storage, construction roads, laydown areas, laboratories and administration facilities.	Included above
Heavy haulage access roads	Heavy haulage northern port access road.	Included above

Non-spatial elements	Description	
Desalination	This facility is located within the area approved under MS 469.	Not applicable

It should be noted that the proposed Action does not include the following:

- geotechnical feasibility works; and
- supporting infrastructure to the Approved Port (i.e. quarry, quarry haul road, construction camp and site offices).

These works are required prior to the anticipated completion of the State Part IV *Environmental Protection Act 1986* (EP Act) assessment process for the proposed Action and are able to be controlled and approved by alternate State-based environmental assessment processes. The quarry (ies) and quarry haul roads have been previously referred to the State and determined not to require Part IV assessment under the EP Act. Notwithstanding, the quarry haul road may impact on a matter of National Environmental Significance (NES) and accordingly formed part of the previously referred action for the ODP (2010/5760). The construction camp and site offices are located on cleared agricultural land and do not impact matters of NES. Therefore these activities do not require referral under the EPBC Act. Other state planning approvals will apply to the aspects of the Project.

2.2 Alternatives to taking the proposed action

No alternatives to undertaking the proposed Action were identified.

The proposed Action is required in association with the Project's deepwater port facilities (the ODP). The ODP was approved by the WA government in 1998 under the *Environmental Protection Act 1986* (EP Act) with the release of Ministerial Statement 469 (MS 469).

During initial Project design, alternatives to development of the ODP were considered. One option was identified which involved expansion of the existing Geraldton Port. This option was not preferred due to:

- the requirement to dredge very hard seabed in the Champion Bay area;
- the impacts of the construction and operation on the Geraldton town site and infrastructure; and
- the still limited land availability and shipping capacities that would be offered compared to other options.

2.3 Alternative locations, time frames or activities that form part of the referred action

No alternative locations, timeframes or activities form part of the proposed Action.

The proposed Action is required at the given location as it encompasses the terrestrial facilities associated with the adjacent ODP (approved under the EP Act through MS 469).

Several alternative Mid-West locations for the ODP were investigated including north of Oakajee River, Georgina, Bradley and Bookara (to the south of the Greenough River), Bonnifield (north of Dongara), Point Moore (near the existing Geraldton Port) and the proposed Action location.

The Oakajee site was identified as the preferred location for development of the Project's deepwater port due to:

- its naturally occurring deepwater close to shore;
- earlier Government support for this locality as a strategic location to support mines and industry in the Mid-West; and
- the reduced potential for social nuisance issues associated with the increased distance from major urban nodes (particularly Geraldton), transport and other industrial activities.

2.4 Context, planning framework and state/local government requirements

On 20 of March 2009 the State Government of WA and OPR entered into a State Development Agreement which provided OPR exclusive rights in relation to the Project.

The proposed Action has been considered in context of the key environmental legislation outlined in Table 3.

Note: in June 2004, the area of the OIE was rezoned 'Industrial Investigation Zone' under the Shire of Chapman Valley Town Planning Scheme No 1 (SoCV TPS). Components of the proposed Action will require planning approval by the Shire.

Environmental approval for the proposed Action is currently being sought under the EP Act independently of this referral.

Table 3 Key Legislation applicable to the project

Legislation	Responsible Government Agency	Aspect
State Government Legislation		
<i>Aboriginal Heritage Act 1972</i>	Department of Indigenous Affairs	Archaeological and ethnographic heritage
<i>Agricultural and Related Resources Protection Act 1976</i>	Department of Agriculture and Food	Invasive weeds and pest animals
<i>Bush Fires Act 1954</i>	Fire and Emergency Services Authority	Wild fire control
<i>Contaminated Sites Act 2003</i>	Department of Environment and Conservation	Management of contaminated lands
<i>Dangerous Goods and Safety Act 2004</i>	Department of Mines and Petroleum	Dangerous goods management
<i>Environmental Protection Act 1986</i>	Department of Environment and Conservation	Environmental Impact Assessment and Environmental Regulation
<i>Health Act 1911</i>	Department of Health	Sewage treatment facilities
<i>Heritage of Western Australia Act 1990</i>	Heritage Council of Western Australia	Non-indigenous heritage management
<i>Local Government Act 1995</i>	Shire of Chapman Valley	Development approvals and management
<i>Local Government (Miscellaneous Provisions) Act 1960</i>	Shire of Chapman Valley	Community issues / resources / facilities
<i>Mines Safety and Inspection Act 1994</i>	Department of Mines and Petroleum	Personnel safety on mine sites
<i>Occupational Safety and Health Act 1984</i>	Department of Commerce	Occupational Safety and Health
<i>Public Works Act 1902</i>	Department of Treasury and Finance	Land access and operation of public work
<i>Rail Safety Act 1998</i>	Department of Transport	Rail safety management
<i>Rights in Water and Irrigation Act 1914</i>	Department of Water	Access to and use of water resources
<i>Soil and Land Conservation Act 1945</i>	Department of Agriculture and Food	Protection of soil resources
<i>Waterways Conservation Act 1976</i>	Department of Water	Protection of surface and groundwater
<i>Wildlife Conservation Act 1950</i>	Department of Environment and Conservation	Protection of indigenous wildlife, including items of state significance
Commonwealth Legislation		
<i>Environmental Protection & Biodiversity Conservation Act 1999</i>	Department of Environment, Water, Heritage and the Arts	Environmental and heritage matters of national significance
<i>National Greenhouse and Energy Reporting Act 2007</i>	Department of Climate Change	Greenhouse gas emissions
<i>Native Title Act 1993</i>	National Native Title Tribunal	Community, group or individual rights and interests of Aboriginal people or Torres Strait Islanders in relation to land or waters
<i>Protection of Moveable Cultural Heritage Act 1986</i>	Department of Environment, Water, Heritage and the Arts	Protection of moveable cultural artefacts

2.5 Environmental impact assessments under Commonwealth, state or territory legislation

The proposed Action was referred to the Western Australian Environmental Protection Authority (EPA) under Section 38 of the EP Act and the level of assessment was set at Public Environmental Review (PER) with a 4 week public consultation period. The PER was submitted to the WA EPA and open for public comment from the 2 August 2010 to the 30 of August 2010. OPR's response to public comments on the PER were submitted to the WA EPA in October 2010. Supplementary Advice to the PER was subsequently prepared and submitted to the WA EPA on the 9 November 2010. The objective of the Supplementary Advice was to document the outcome of design revisions undertaken to minimise impacts and present the revised footprint of the proposed Action.

The proposed Action has not previously been assessed at the Commonwealth level.

2.6 Public consultation (including with Indigenous stakeholders)

OPR is committed to ongoing stakeholder and community engagement and recognises the importance of genuine stakeholder involvement in the identification of potential issues and concerns, as well as appropriate strategies for management of impacts. In order to ensure a local presence and be responsive to local community interest in the proposed Action, OPR opened a Mid-West Community Office at 260 Foreshore Drive, Geraldton. Local community and stakeholders are able to visit or speak to an OPR staff member during office hours from Monday to Friday.

OPR has worked closely with the Western Australian Government's Oakajee Policy Team regarding the development of the proposed Action, as well as relevant government agencies, the Geraldton Iron Ore Alliance and Mid-West stakeholders. Substantial consultation with the Government and the community has been undertaken in the preparation and finalisation of the PER documents. The PER was open for public comment in August 2010 and a summary of submissions has been received from the EPA. A total of 12 submissions were received including nine government submissions and three non government submissions. Key issues raised were in relation to clearing of restricted vegetation associations and Priority Flora species. OPR have since revised the footprint of the proposed Action to further minimise impacts to these sensitive species.

The area of the proposed Action is within the external boundaries of land subject to claims from three native title claimant groups including:

- Naaguja People
- Amangu People
- Mullewa Wadjari Community

OPR has been consulting with these groups in relation to heritage issues since late 2008.

A Heritage Protocol has been agreed between OPR and the claimant groups that sets out the heritage management requirements in detail. These agreements will form the cornerstone of OPR's Aboriginal Cultural Heritage Management Plan that will guide implementation of Indigenous Heritage Management for the proposed Action.

OPR are also working with the registered claimants to develop a comprehensive agreement which will outline opportunities for Indigenous involvement in the proposed Action, including employment, training and contract arrangements.

2.7 A staged development or component of a larger project

The proposed Action is a component of the multi-proponent Oakajee Port and Rail Project, a 45 Mtpa Deepwater Port and 570 km rail development. The Project comprises of three components: the State approved ODP (MS 469), the OPR Rail Development and the OPR Terrestrial Port Development (the proposed Action).

The WA Department of State Development (DSD) is the proponent for the ODP which comprises the marine component of the port and a small area of associated disturbance on the adjacent land. OPR is the proponent for the proposed Action and the OPR Rail Development. Once constructed, the Rail Development will be transferred to the Public Transport Authority along with relevant approvals.

Separate *Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act) referrals have been prepared and submitted for each of the three components of the Project, being the OPR Rail Development (2010/5500) and the Oakajee Deepwater Port (2010/5760). This was considered the best approach given that the components involve different parties, affect different matters of NES and have been assessed independently of each other through the State PER process. Combined assessment may have proven problematic for any accreditation of the PER process under the bilateral agreement between the Commonwealth and State.

3 Description of environment & likely impacts

3.1 Matters of national environmental significance

3.1 (a) World Heritage Properties

Description

There are no World Heritage Properties in the vicinity of the proposed Action.

Nature and extent of likely impact

Not applicable

3.1 (b) National Heritage Places

Description

There are no National Heritage Places in the vicinity of the proposed Action.

Nature and extent of likely impact

Not applicable

3.1 (c) Wetlands of International Importance (declared Ramsar wetlands)

Description

There are no Wetlands of International Importance in the vicinity of the proposed Action.

Nature and extent of likely impact

Not applicable

3.1 (d) Listed threatened species and ecological communities

Description

An EPBC Act Protected Matters search was conducted on 12 October 2010 (Appendix E) for the proposed Action area and surrounds (i.e. the OIE inclusive of buffer and inlet and outlet pipes associated with desalination plant). The search identified 21 threatened species as potentially occurring. These included eight terrestrial fauna species, three terrestrial flora species, four marine mammal species, three marine reptile species and three shark species.

As part of the environmental impact assessment (EIA) for the proposed Action, OPR commissioned Ecologia to undertake a baseline terrestrial vertebrate fauna survey (Ecologia 2010a, Appendix A) and a single phase Level 2 survey of the vegetation and flora (Ecologia 2010b, Appendix A) within the proposed Action and surrounds. The scope of the surveys (the Study Area) covers an area larger than the footprint of the proposed Action, extending approximately 12 km along the coast (between the Oakajee and Buller Rivers) and approximately 7 km inland at its widest point (Figure 4).

Threatened Terrestrial Fauna

The eight terrestrial fauna species identified in the EPBC Act Protected Matters search as potentially occurring on or near the proposed Action site are:

- Carnaby's Black-Cockatoo (*Calyptorhynchus latirostris*) – Endangered
- Tristan Albatross (*Diomedea exulans exulans*) - Endangered
- Southern Giant-Petrel (*Macronectus giganteus*) – Endangered
- Australian Lesser Noddy (*Anous tenuirostris melanops*) - Vulnerable
- Northern Giant-Petrel (*Macronectus halli*) – Vulnerable
- Soft-plumaged Petrel (*Pterodroma mollis*) – Vulnerable
- Indian Yellow-nosed Albatross (*Thalassarche carteri*) - Vulnerable
- Shy Albatross (*Thalassarche cauta cauta*) – Vulnerable.

Carnaby's Black-Cockatoo

Carnaby's Black-Cockatoo, also known as Short billed Black-Cockatoo, is endemic to the south west of Western Australia ranging from the lower Murchison River in the north (15 km NNW of Balline), throughout the southwest corner and east to Cape Arid (Johnstone 2010). Although not recorded within the Study Area, Carnaby's Black-Cockatoo has been historically recorded near Oakajee, with one record from 1983 at Howatharra (10 km east of Oakajee) and has been observed south of Geraldton (>25km south of Oakajee) during the Ecologia fauna survey (2010a). Records from the Storr-Johnstone Bird Data Bank show the most recent recordings were multiple sightings along Chapman Valley Rd in 2006 indicating there was a small breeding population in the Chapman Valley/Yetna/Nabawa region (approximately 10-20 km north east of Oakajee) at the time (Johnstone 2010). Most of these records appear to be of flocks migrating south south-west during the

autumn/winter period from their breeding quarters in the northern Wheatbelt (Johnstone 2010). No breeding population has been recorded in the Oakajee area (Johnstone 2010). Other records of this species in the region come from Geraldton, Dongara and the Murchison River near Kalbarri (Ecologia 2010a).

Although Carnaby's Black-Cockatoo has not been recorded in or immediately around the Study Area, it may potentially forage in remnant vegetation within the footprint of the proposed Action as suitable species for feeding are present in some areas of woodland. Additionally, a small area of potential breeding habitat is present in riparian vegetation located within the proposed Action footprint. Potential impacts to this species habitat are described below under 'Nature and Extent of Impact to Fauna' (page 17).

Other bird species

The Tristan Albatross was not recorded during the Ecologia (2010a) fauna survey and only one definitive record of the bird has ever been made in Australian waters after a chick that was banded on Gough Island (South Atlantic) was recaptured four years later off Wollongong (NSW) (SEWPAC 2010). The Tristan Albatross is a marine, pelagic seabird that occurs in a single population which breeds on Inaccessible Island and Gough Island in the Atlantic Ocean and forages in open water in the Atlantic Ocean near the Cape of Good Hope (South Africa) (SEWPAC 2010). Based on the known breeding and foraging habitat of the species and lack of sightings in Australian waters the Tristan Albatross is unlikely to occur within the Oakajee area. It is thus highly unlikely that the proposed Action will have a significant impact on this species.

During the Ecologia (2010a) fauna survey the Southern Giant-Petrel was not observed within the Study Area; however it was observed utilising pelagic marine habitats adjacent to the Study Area. Coastal habitats required by the Southern Giant-Petrel are found commonly along the coastline of Australia and the birds have been shown to prefer nesting in colonies on islands. Whilst it is possible that the Southern Giant-Petrel frequents the area to forage for coastal food sources (krill and amphiod crustaceans, fish and squid), the species however, was not recorded within the Study Area and there are no suitable nesting habitats present. To this end, it is highly unlikely that the proposed Action will have a significant impact on the species.

The remaining bird species identified through the protected matters search were not recorded during the fauna surveys, including the Australian Lesser Noddy, Northern Giant Petrel, Soft-plumaged Petrel, Indian-nosed Albatross and the Shy Albatross (Ecologia 2010a). These species also breed on islands and forage for marine food sources including krill, amphiod crustaceans, fish and squid. Whilst it is possible that these species may forage in close vicinity to the Study Area, the nature of foraging habitat is vast and widely dispersed along coastlines, out at sea or in seas close to breeding islands, including outside fringing reefs. Given the vast and dispersed nature of these foraging habitats, it is highly unlikely that the proposed Action will have a significant impact on any of these species.

Threatened Terrestrial Flora

The three flora species identified in the EPBC Act Protected Matters search as potentially occurring on or near the proposed Action site are:

- Moresby Range Drummondita (*Drummondita ericoides*) – Endangered
- Mallee Box (*Eucalyptus cuprea*) – Endangered
- *Hypocalymma longifolium* – Endangered

Following extensive survey efforts throughout the study area (Ecologia, 2010b), neither Mallee Box (*Eucalyptus cuprea*), Moresby Range Drummondita (*Drummondita ericoides*) or *Hypocalymma longifolium* were recorded within the Study Area. Due to the thorough survey effort and the limited habitat suitable for these species within the Study Area it is considered unlikely that they will be affected by the proposed Action.

Threatened Ecological Communities

No nationally listed Threatened Ecological Communities exist within the footprint of the proposed Action (Ecologia 2010b).

Threatened Marine Fauna

The ten marine fauna species identified in the EPBC Act Protected Matters search as potentially occurring are:

- Blue Whale (*Balaenoptera musculus*) - Endangered
- Southern Right Whale (*Eubalaena australis*) - Endangered
- Humpback Whale (*Megaptera novaeangliae*) - Vulnerable
- Australian Sea-lion (*Neophoca cinerea*) - Vulnerable
- Loggerhead Turtle (*Caretta caretta*) - Endangered
- Green Turtle (*Chelonia mydas*) - Vulnerable
- Leathery Turtle, Leatherback Turtle (*Dermochelys coriacea*) - Endangered
- Grey Nurse Shark (west coast population) (*Carcharias taurus*) - Vulnerable
- Great White Shark (*Carcharodon carcharias*) - Vulnerable
- Whale Shark (*Rhincodon typus*) – Vulnerable.

Baseline marine habitat surveys have been conducted by Oceanica (2010) to describe the existing marine habitats and health in the vicinity of the proposed ODP and the surrounding region (from Coronation Beach to Buller River out to the 20 m depth contour, an area of approximately 80 km²). The surveys consisted of a pilot survey in October to December 2007, followed by a fourteen month survey from November 2008 to December 2009. The baseline investigation has provided data on marine fauna species diversity, relative abundance and distribution in space and time in the vicinity of the Oakajee Port (Oceanica 2010). This has informed the following assessment of likelihood of occurrence of the fauna species identified in the EPBC Act Protected Matters search.

Blue whale

During thirty-three aerial surveys conducted from 5 November 2008 - 29 January 2010, four adult Blue Whales were recorded, with three recorded south-west of Pelsaert Island over 80 km from the proposed Action and one recorded east of the Abrolhos Island group approximately 40 km from the proposed Action. Blue Whale sightings in Australian waters have been widespread, and it is likely that the whales occur right around the continent at various times of the year with much of the Australian continental shelf and coastal waters having no particular significance to the whales that utilise them for migration and opportunistic feeding. The only known areas of significance to Blue Whales are feeding areas around the southern continental shelf, notably the Perth Canyon, in Western Australia, and the Bonney Upwelling and adjacent upwelling areas of South Australia and Victoria (SEWPAC 2010).

Southern Right Whale

The Southern Right Whale was not frequently observed in the surveys, with confirmed sightings of only nine individuals during the baseline studies (Oceanica 2010). These nine animals were widely spread in their distribution, with no trends or aggregation behaviour evident. The nearest of these animals was over 10 km from the proposed Action. Southern Right Whales are seasonally present on the south-west Australian coast between May and November and it is reported that the species is experiencing sound recovery rates in line with the theorised maximum biological rate of increase across a wide proportion of its known range (SEWPAC 2010).

Humpback Whale

Humpback Whales were frequently observed and formed the majority of all marine mammal sightings during the baseline studies with distances from shore ranging from approximately 1.5 km to more than 15 km (Oceanica 2010). The distribution of Humpback Whales was dispersed across the region during the northern migratory period (peaking late June/early August) with moderate clusters during the southern migration period (peaking mid September/late November). The west and north-west coast of Australia is particularly important for Humpback Whales whose known breeding and calving grounds are between Broome and the northern end of Camden Sound with the migration path between Point Cloates and North West Cape leading to the Southern Ocean. Humpback Whales migrate north from their Antarctic feeding grounds around May each year, reaching

the waters of the North-west Marine Region in early June. Observations of whale behaviour during the baseline studies support the view that Oakajee is not a resting or aggregation area for whales and no observations were made of whales breeding or calving in the data set.

Australian Sea-lion

Two Australian Sea-lions were observed swimming in the Oakajee region during the baseline marine mammal surveys (Oceanica 2010). A breeding colony is located approximately 55 km west on the Abrolhos Islands and a small, non-breeding haul-out colony of approximately 10-15 sub-adult males and occasional females are known to use the breakwater at Geraldton Port, 24 km south of Oakajee. There is no indication that the Oakajee area is used by Australian Sea-lions to 'haul-out' or rest.

Turtles

No turtles were observed during the baseline surveys and there are no known nesting sites located in the region (Oceanica 2010). Six species of sea turtle occur in western Australian waters: the Green (*Chelonia mydas*), Flatback (*Natator depressus*), Loggerhead (*Caretta caretta*), Hawksbill (*Eretmochelys imbricata*), Olive Ridley (*Lepidochelys olivacea*) and Leatherback (*Dermochelys coriacea*). Among these, Leatherbacks have the greatest worldwide distribution but occur at low densities throughout their range and rarely breed in Australia. Green Turtles are the most common species found worldwide and breed extensively in northern Western Australia. The southern limit of their breeding range is probably the North West Cape while Green Turtles are found using waters as far south as Rottnest Island to forage (SEWPAC 2010). The Loggerhead Turtle has a more temperate distribution and has the most southerly nesting range of all species nesting in Western Australia (Shark Bay). It is also the most commonly observed marine turtle species in South Western Australia, but was not observed during baseline studies. Loggerhead and Leather Turtles are not known to occur in the area, although the Loggerhead has been recorded further south in waters off Perth. Green Turtles are rarely seen in the Geraldton region but may use the area periodically for foraging (Tingay and Associates 1997).

Sharks

None of the three EPBC listed shark species were observed during baseline surveys (Oceanica 2010). Three sharks in total were recorded over the survey period; however, these were not identifiable given their short surface time during observation and poor visibility conditions. There are no known sightings or capture information for Grey Nurse Sharks in the Oakajee area and Oakajee was not identified as an important aggregation site for the Western Australian Grey Nurse population in a comprehensive study by Chidlow *et al* (2006). In addition shallow sightings of these sharks only often occur in 15-40 m depth in or near deep sandy bottomed-gutters or rocky caves (SEWPAC 2010), habitat which does not occur near the desalination outfall or within the Oakajee area. Great White Sharks and Whale Sharks are both inherently migratory species. Whale Sharks seasonally aggregate in coastal waters off Ningaloo Reef between March and July each year, at Christmas Island between December and January, and in the Coral Sea between November and December. Great White Sharks are normally found in inshore waters in the vicinity of rocky reefs and islands, and often near seal colonies (SEWPAC 2010).

Nature and extent of likely impact

Carnaby's Black Cockatoo – Extent of Impacts

Previous studies (Ecologia 2010) have indicated that the proposed Action may potentially impact upon foraging and breeding habitat of Carnaby's Black-Cockatoo *Calyptorhynchus latirostris* (Ecologia 2010b) which is listed federally as Endangered under the EPBC Act.

During baseline investigations, a single phase Level 2 survey of the vegetation and flora and subsequent vegetation mapping using colour aerial photography was conducted (Ecologia 2010b). A desktop assessment of this vegetation mapping was conducted to identify vegetation associations containing plant genera known to be used by Carnaby's Black-Cockatoo as foraging habitat; a total of six vegetation associations were identified (Ecologia 2010c, Appendix C). In order to appropriately characterise the nature and extent of potential impacts of the proposed Action to Carnaby's Black-Cockatoo, OPR commissioned a further field investigation of these six vegetation associations to conduct habitat mapping and record the habitat type, condition, and presence of plant species from genera known to be used by Carnaby's Black-Cockatoo as foraging habitat (Ecologia 2010c, Appendix C).

OPR subsequently commissioned Eco Logical Australia (ELA) to conduct a detailed literature review to develop criteria for the assessment of potential Carnaby's Black-Cockatoo foraging and breeding habitat within the Oakajee region. These criteria were then used in conjunction with the habitat mapping information (Ecologia 2010c) to quantify the proposed Action's potential impact on likely suitable Carnaby's Black-Cockatoo habitat (ELA 2010, Appendix C).

The results of habitat mapping and subsequent assessment are summarised in Table 4 below. It is considered that the 0.3 ha of riparian habitat affected by the proposed Action may be considered potential breeding habitat for Carnaby's Black-Cockatoo. The riparian vegetation has been considered as potential breeding habitat given the presence of trees with a diameter breast height (DBH) of > 500 mm (ELA 2010). Seven such trees are within the 0.3 ha of riparian habitat affected by the proposed Action (Figure 6) (ELA 2010). The potential for Carnaby's Black-Cockatoo breeding habitat was restricted to Ecologia (2010b) vegetation association 7 (also referred to as GRFVS (WAPC 2010) vegetation association 2). Based on the GRFVS results (which identified 388.4 ha of this vegetation association in the Geraldton Sandplains (G.S.) region) the proposed Action impacts (1.3 ha) will only result in the clearing of 0.3% of the known regional extent. OPR will continue to assess engineering and design requirements to seek opportunities to avoid impacts to the identified potential breeding trees.

In relation to foraging habitat, there is little information on the actual flora species used for feeding purposes in the G.S. region. Potential foraging habitat to this end could only be defined by vegetation dominated or characterised by dense occurrence of flora species from genera commonly associated with foraging flora species (ELA 2010). The habitat assessment concluded that a total of 56.9 ha of potential Carnaby's Black-Cockatoo foraging habitat will be impacted through implementation of the proposed Action (Figure 7) (ELA 2010). In this assessment OPR have taken a highly conservative approach by accounting for species where the actual foraging value at Oakajee is in fact unknown. As a result, the presented impacts of the proposed Action to Carnaby's Black-Cockatoo foraging habitat (56.9 ha) is likely to be an overestimate of the true impact. Nevertheless, OPR is committed to developing appropriate management, mitigation and offset measures to address potential impacts to Carnaby's Black-Cockatoo habitat as defined within this assessment (refer Section 4 and Table 8).

Habitat mapping has only been conducted within the footprint of the proposed Action and information regarding the presence and condition of flora species suitable for Carnaby's Black-Cockatoo foraging habitat is not available for the wider G.S. region. Therefore, the regional impacts of the proposed Action to potential foraging habitat may only be examined through an assessment of regional vegetation mapping. Habitat mapping of *Bankisa* woodland was limited to Ecologia (2010b) Vegetation Association 6 (also referred to as GRFVS (WAPC 2010) Vegetation Association 13). Based on the GRFVS results (which identified 754.4 ha of this vegetation association in the G.S. Bioregion) the proposed Action impacts (13.3 ha) will only result in clearing of 1.8% of the known regional extent.

Table 4 Summary of Carnaby's Black-Cockatoo breeding and foraging habitat suitability assessment. Habitat mapping units within the proposed Action footprint were assessed against habitat suitability criteria (ELA 2010).

Habitat Mapping Unit	Vegetation Type	Potential Food Species	Density of food species	Vegetation Condition	Food Species Condition	Total area (ha)	Potential Foraging Habitat?	Potential Breeding Habitat?
Riparian Vegetation	Riparian	<i>E. camaldulensis</i> , <i>C. obesa</i>	Dominant species	Good	Good	0.17	NO	YES
	Riparian	<i>E. camaldulensis</i>	Scattered	Good	Poor	0.16	NO	YES
Acacia-Grevillea scrub	Acacia-Grevillea scrub	<i>G. argyrophylla</i>	Moderate	Good	Good	2.23	YES	NO
	Mixed Acacia, Grevillea, Banksia heath.	<i>G. argyrophylla</i> , <i>B. sessilis</i> , <i>H. recurva</i> , <i>A. campestris</i>	Moderately dense	Good	Good	4.11	YES	NO
Acacia-Hakea scrub	Acacia-Hakea scrub	<i>H. recurva</i>	Moderate	Good	Good	2.38	YES	NO
	Acacia-Hakea scrub	<i>H. recurva</i>	Scattered	Degraded	Good	1.9	NO	NO
Eucalyptus Mallee	Melaleuca Eucalypt Mallee	<i>E. dolichocera</i>	Moderate	Very good	Good	0.77	NO	NO
Melaleuca Grevillea scrub	Melaleuca-Grevillea scrub	<i>G. argyrophylla</i>	Moderate	Good	Good	39.99	YES	NO
	Melaleuca-Grevillea scrub	<i>G. argyrophylla</i>	Scattered	Good	Good	4.81	NO	NO
Banksia Woodland	Banksia Woodland	<i>B. prionotes</i>	Scattered	Degraded	Poor	3.55	YES	NO
	Banksia Woodland	<i>B. prionotes</i> , <i>B. Sessilis</i>	Moderate	Good	Poor	4.61	YES	NO
Re-vegetation	Re-vegetation	Introduced eucalypt species	Moderate	Not surveyed	Not Surveyed	1.84	NO	NO
Total						66.52	56.87	0.33

Green shading indicates potential foraging habitat

Blue shading indicates potential breeding habitat

The loss of some of this potential habitat is not expected to significantly affect the species because:

- The species was not observed within the development areas during field surveys, there are no existing records for the species within the development area and the species is not thought to be a common visitor to the region.
- The species is not expected to breed in the area (Barrett *et al* 2003), based on breeding distribution; the closest recording of a breeding population near Oakajee was at Howatharra (10 km away) in 1983.
- The quality of a substantial portion of the vegetation within the proposed Action footprint is only in good to degraded condition due to weeds and grazing.
- Predicted impacts to *Banksia* woodland (a vegetation type considered to be typical foraging habitat for

Carnaby's Black-Cockatoo) are limited to 1.8% of the known regional extent, reducing the significance of the local impact.

- The estimated impacts of the proposed Action include 42.2 ha of vegetation that is classified as potential foraging habitat based solely on the presence of *G. argyrophylla*, a species for which the actual foraging value at Oakajee is unknown (ELA 2010).

Where possible, disturbance of areas of foraging habitat will be minimised to the infrastructure footprint and foraging habitat disturbed for construction but not required for permanent infrastructure will be rehabilitated using suitable flora species for cockatoo feeding purposes.

Will the action lead to a long-term decrease in the size of a population of a species?

The proposed Action is unlikely to lead to a long-term decrease in the size of a population of the species given the Storr-Johnstone Bird Data Bank indicates that there are no breeding records for the Oakajee area. Furthermore, breeding habitat mapping and assessment indicates that impact to potential breeding habitat is limited to seven trees and 0.3% of the known regional extent. There does appear to be a small breeding population in the Chapman Valley – Yetna – Nabawa region 10-20 km from Oakajee, based on observations in 2006, and Oakajee could be frequented by the population for foraging. The absence of recent records from the area with the nearest recording being from Howatharra (10 km east of Oakajee) in 1983 suggests it is not a common visitor to the area.

Will the action reduce the area of occupancy of a species?

The proposed Action will not reduce the area of occupancy of an important population of Carnaby's Black-Cockatoo as no breeding population is known in the Oakajee area and the vegetation on-site is unlikely to be frequently used for foraging by the species travelling from further afield.

Will the action fragment an existing population into two or more populations?

The Proposed Action is not expected to fragment an existing important population as no population has been observed in the Study Area and the clearing involved does not cause severance of any habitats. The species is highly mobile and travels large distances between feeding areas therefore the clearing of some of the potential foraging habitat would not represent a barrier for movement.

Will the action adversely affect habitat critical to the survival of the species?

The proposed Action will not adversely affect habitat considered critical to the survival of Carnaby's Black-Cockatoo. No breeding populations are known in the Oakajee area and only seven potential breeding habitat trees have been identified within the proposed Action footprint.

The Study Area contains a small portion of potential feeding habitat to the species, which includes *Banksia* open woodland and open scrub and heath. In addition to potential foraging habitat, it is considered that 0.3 ha of riparian habitat affected by the Proposal may be considered *potential* breeding habitat for Carnaby's Black-Cockatoo, this impact to habitat is considered relatively low considering proposed mitigation and offsets for the area impacted. The proposed Action is located in the species' far northern range and it is not expected to be a common visitor to the area. The species has recently been more commonly observed further inland in the Chapman Valley area.

Will the action disrupt the breeding cycle of a population?

The proposed Action will not disrupt the breeding cycle of an important population of Carnaby's Black-Cockatoo. No breeding populations are known in the Oakajee area and only seven potential breeding habitat trees have been identified within the proposed Action footprint. Clearance of the only vegetation association with a known potential to contain breeding habitat trees is limited to 0.3% of its known regional extent.

Will the action modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline?

The loss of potential foraging habitat is always of concern to the species; however, it is considered unlikely the proposed Action alone could lead to a decrease in the 'size' of Carnaby's Black-Cockatoo population. Potential

foraging habitat within the proposed Action area occurs in a few small remnants and is unlikely to be a major source of food for Carnaby's Black-Cockatoos, given their known distribution has been greatly reduced and they are not commonly sighted in the region.

Will the action result in invasive species that are harmful to an endangered species becoming established in the endangered species' habitat?

The proposed Action has a low potential to directly introduce invasive species to mobile populations of cockatoos. There are numerous introduced flora species (weeds) in the Study Area; however, implementation of weed management strategies contained within the Flora and Vegetation Management Plan (Appendix D) during construction and maintenance of areas to be conserved should ensure the viability of those areas is not threatened by weed infestation. Tree and shrub species primarily used by the species are also less vulnerable to weed invasion compared to groundcover species.

Will the action introduce disease that may cause the species to decline?

The proposed Action has a low potential to introduce disease directly to mobile populations of cockatoos.

Phytophthora (Dieback) was recorded during two previous flora surveys (Dames and Moore 1993, Muir Environmental 1997). Dieback and weed management strategies within the Flora and Vegetation Management Plan (Appendix D) will be implemented for the proposed Action to ensure the infection is not spread to those areas being retained, which could cause the loss of vulnerable flora species of importance as fodder to Carnaby's Black-Cockatoo.

Will the action interfere with the recovery of the species?

The proposed Action will not interfere substantially with the recovery of the species. The clearing of any potential habitat for the Carnaby's Black-Cockatoo possibly interferes with the recovery efforts for the species; however, the proposed clearance is not near a known breeding population and a significant area of available potential feeding habitat will be left undisturbed.

Marine Fauna – Extent of Impacts

The only aspect of the proposed Action with the potential to impact upon marine fauna of NES are associated with the desalination plant intake and outlet pipe construction, and in particular the discharge of brine from the desalination plant itself.

In construction, the desalination intake and outlet pipes will be pinned to the seabed with concrete mattresses/saddles which will effectively be laid over the top of this infrastructure. Some minor disturbance to the seabed may be required to seat the diffuser pipe for stability on the south side of the ODP breakwater; however, this will not involve blasting or piling activities that may impact marine fauna. Construction requirements for the desalination plant are minor and will fit within the footprint of the Port Marine development. Construction of infrastructure in the marine environment is dealt with in detail within the ODP Port Marine referral (2010/5760). Accordingly, it is considered that this temporary disturbance for installation of the pipes will have no significant impact on matters of National Environmental Significance.

The potential impacts from the brine are associated with changes in the physical and chemical properties of the receiving waters, which in turn, have the potential to impact marine flora and fauna. The desalination plant will generate up to approximately 18 ML per day of hypersaline water (salinity of approximately 64,000 mg/L) that will be disposed of by return to the ocean, via a 48 m diffuser which will be located at depth of approximately 8 m on the southern side of the approved ODP breakwater (MS469), 800 m from the shore (Figure 5).

To establish the dilution requirements for the discharge of brine at Oakajee, CEE (2010) conducted a literature review of the current information available on desalination processes. Ecotoxicity testing at Perth, Adelaide and Wonthaggi desalination plants has found that a dilution of 30:1 is more than adequate to provide high protection to the ecosystem (CEE 2010, Appendix B). Based on this information, a conceptual diffuser design was developed by CEE (2010) to reach a minimum initial dilution of 34:1 within 30 m of the diffuser under worst case discharge conditions (i.e. calm current and low discharge velocity). Oakajee is located on the high energy coast, with swell and waves creating local surge and mixing for the majority of the time (CEE 2010). On this

basis, and due to the location and design of the desalination outlet and diffuser (CEE 2010, Appendix B) it is considered that the desalination outfall will have a minimal affect on marine water quality and any Benthic Primary Producer Habitat and will be constrained within a 30 m radius of the diffuser.

Further hydrodynamic modelling has also been undertaken for the discharge brine at Oakajee (APASA 2010, Appendix B). The model results were assessed against a trigger value for the median salinity difference between the existing and proposed conditions. This trigger value was defined at 0.8 parts per thousand (ppt) at a depth 0.5 m above the seabed, consistent with high ecological protection areas (HEPA) as described in “*Environmental Quality Criteria Reference Document for Cockburn Sound (2003-2004) - A supporting document to the State Environmental (Cockburn Sound) Policy 2005*” (EPA 2005). The hydrodynamic modelling results show that under low energy conditions a maximum median salinity difference of 0.35 ppt (0.45 ppt less than the trigger level) may result within the receiving environment. Thus, it is considered highly unlikely that the proposed Action will significantly impact on the marine environment or any marine fauna of NES.

Allowing for some conservatism, the boundary for a low ecological protection area (LEPA) is proposed to extend 50 m in all seaward directions from the diffuser. Monitoring and management strategies for the LEPA are discussed further in Section 4.

Given the limited extent of potential impacts associated with desalination plant outfall following the proposed mitigation measures relating to suitable brine dilution at the diffuser and the remote sightings/low density of marine fauna from the project area, the lack of significant feeding habitat in the direct area of the proposed Action and the absence of breeding grounds it is highly unlikely that the proposed Action will have any significant impact on marine fauna species.

3.1 (e) Listed migratory species

Description

The EPBC Act Protected Matters search (Appendix E) identified 22 migratory species as potentially occurring within the proposed Action and surrounding area. These included ten terrestrial fauna species and 12 marine fauna species.

Migratory Terrestrial Fauna

The ten migratory terrestrial fauna species identified in the EPBC Act Protected Matters search as potentially occurring are:

- White-bellied Sea-eagle (*Haliaeetus leucogaster*)
- Rainbow Bee-eater (*Merops ornatus*)
- Great Egret, White Egret (*Ardea alba*)
- Cattle Egret (*Ardea ibis*)
- Fork-tailed Swift (*Apus pacificus*)
- Tristan Albatross (*Diomedea dabbenena*)
- Southern Giant-Petrel (*Macronectus giganteus*)
- Northern Giant-Petrel (*Macronectus halli*)
- Indian Yellow-nosed Albatross (*Thalassarche carteri*)
- Shy Albatross (*Thalassarche cauta cauta*)

In addition, a vertebrate fauna survey by Ecologia (2010a) recorded two other listed migratory species within the proposed Action area:

- Eastern Osprey (*Pandion cristatus*)
- Grey Plover (*Pluvialis squatarola*)

Based on sighting records and on the habitat present in the Study Area, it is considered unlikely that the Tristan Albatross, Southern Giant-Petrel, Northern Giant-Petrel, Indian Yellow-nosed Albatross and Shy Albatross would occur within the Study Area and therefore the proposed Action would not significantly impact on these species [see section 3.1 (d)].

Neither the Great Egret nor Cattle Egret were recorded within the Study Area during the fauna survey (Ecologia 2010a). These species may utilise the typically dry water courses that occur in the Study Area when water is present; however this type of habitat largely lies outside of the proposed Action footprint with approximately 3% of riverine vegetation occurring within the Study Area likely to be impacted. The study area is not recognised as important habitat for these species. Therefore, the proposed Action is not expected to impact significantly on these species.

The White-bellied Sea-eagle, Rainbow Bee-eater, Fork-tailed Swift, Eastern Osprey and Grey Plover are discussed in further detail below under 'Nature and Extent of Likely Impact' (page 22).

Migratory Marine Fauna

The 12 marine fauna species identified in the EPBC Act Protected Matters search as potentially occurring are:

- Bryde's Whale (*Balaenoptera edeni*)
- Blue Whale (*Balaenoptera musculus*)
- Dugong (*Dugong dugon*)
- Southern Right Whale (*Eubalaena australis*)
- Dusky Dolphin (*Lagenorhynchus obscurus*)
- Humpback Whale (*Megaptera novaeangliae*)
- Killer Whale, Orca (*Orcinus orca*)
- Loggerhead Turtle (*Caretta caretta*)
- Green Turtle (*Chelonia mydas*)
- Leatherback Turtle, Leathery Turtle, Luth (*Dermochelys coriacea*)
- Great White Shark (*Carcharodon carcharias*)
- Whale Shark (*Rhincodon typus*)

Based on historical records, lack of observations during baseline surveys, lack of typical habitat in relation to the proposed Action and the minimal impacts associated with the desalination outfall it is considered highly unlikely that the Blue Whale, Southern Right Whale, Humpback Whale, Loggerhead Turtle, Green Turtle, Leatherback Turtle, Great White Shark and Whale Shark would be significantly impacted by the proposed Action [see section 3.1 (d)].

Nature and extent of likely impact

Bryde's Whale

No confirmed sightings of Bryde's Whale were made during the baseline surveys (Oceanica 2010). During investigations the category 'baleen whales' was used to describe other whales from the Genus *Balaenoptera* where species could not be verified due to short surface time and poor visibility conditions. Only two baleen whales were observed over the entire baseline survey program. In addition Bryde's Whale appears to be limited to the 200 m depth isobar, moving along the coast in response to availability of suitable prey (SEWPAC 2010) and can be found in waters as deep as 500 m to 1000 m.

Dusky Dolphin

The Dusky Dolphin was not recorded during the marine baseline surveys (Oceanica 2010). The Dusky Dolphin has not been well surveyed in Australian waters, with only 13 records since 1828 including a few sightings on various vessels and beach cast animals (SEWPAC 2010). While the species is considered to primarily inhabit inshore

waters, it is also known to inhabit pelagic waters at times and no sightings have been made within or near the Oakajee region.

Killer Whale

The Killer Whale was not recorded during the marine baseline surveys (Oceanica 2010). Killer Whale habitat is difficult to categorise given the cosmopolitan nature of the species and its ability to inhabit all oceans. In addition there are no known records of Killer Whale sightings within or near the Oakajee region. Considering that the majority of Humpback Whale, dolphin and other marine fauna sightings were mostly away from the coast at distances greater than 5 km from shore, the desalination outfall is not expected to present any impediment to marine species migratory patterns or other activities in the Oakajee region.

White-bellied Sea-eagle

The White-bellied Sea-eagle occurs in coastal and near-coastal areas across Australia inhabiting most types of habitats except closed forest. It feeds mainly on aquatic animals, and breeds almost wholly on islands (Johnstone and Storr 1998). This species is considered moderately common in the Houtman Abrolhos Islands off Geraldton and has also been recorded in Horrocks (30 km north north-west) and Drummond Cove (10 km south) (Birddata, EPBC Database).

The White-bellied Sea-eagle was recorded once during the May survey (Ecologia 2010a) when it was observed flying along the coastline, north of the Oakajee River within the Study Area (Figure 8). The White-bellied Sea-eagle may utilise the Study Area for roosting and occasionally hunting, but breeds almost wholly on islands (Johnstone and Storr 1998). Because similar habitats and adjacent oceanic fishing areas suitable for the species occur to the north and south, the location of the proposed Action is not considered to be 'critical' hunting habitat for local birds (Ecologia 2010a) and the clearing impacts of the proposed Action to potential habitat are minor compared to the available habitat of this species locally and regionally. The species is therefore unlikely to be significantly impacted by implementation of the proposed Action.

Rainbow Bee-eater

The Rainbow Bee-eater lives almost anywhere suitable for hawking insects. Part of the population migrates between Australia and Indonesia, moving south over summer and breeding in Australia (Johnstone and Storr 1998). In the region, this species occurs as a breeding visitor during summer. They are scarce to very common throughout much of Western Australia, except for the arid interior, preferring lightly-wooded, preferably sandy country near water (Johnstone and Storr 1998).

Rainbow Bee-eaters were recorded during the summer survey within the Study Area, commonly near the Oakajee River and adjacent woodland (Ecologia 2010a) (Figure 8). This species may breed in the area from October to mid December, during which time impacts to individuals (nestlings) are possible. However possible impacts to individuals within the Study Area are unlikely to cause significant decline in the local or regional population of this species as it is commonly recorded in the surrounding region from September to March (Birds Australia 2009). Additionally, sandy banks and cuttings of the riverine areas, which are favoured by breeding Rainbow Bee-eaters, will largely be unaffected by the proposed Action.

Furthermore, records indicate that the distribution of the Rainbow Bee-eater has expanded in south-western Australia. The Rainbow Bee-eater was rare around Perth during the 19th century, and was recorded only infrequently before the 1920s. However, the bird had begun to visit Perth regularly and in larger numbers by the late 1970s, and it colonised Rottne Island in 1977.

On this basis, the species is unlikely to be significantly impacted by the proposed Action.

Fork-tailed Swift

The Fork-tailed Swift is a small insectivorous bird that is a relatively common trans-equatorial migrant, arriving in the Kimberley in late September, and reaching the south-west by mid-December (Johnstone and Storr 1998, Morcombe 2000). In Western Australia, the Forktailed Swift is considered uncommon to moderately common near the north-west, west and south-east coasts, common in the Kimberley and rare or scarce elsewhere (Johnstone and Storr 1998).

The Fork-tailed Swift was recorded twice within the Study Area during the December fauna survey, observed foraging above the limestone ridge at Site 5 (Figure 8), and also observed above coastal sand dunes near the

Oakajee River mouth (Ecologia 2010a).

Fork-tailed swifts are nomadic in response to broad-scale weather pattern changes. They are attracted to thunderstorms where they can be seen in flocks, occasionally up to 2,000 birds. They rarely land, living almost exclusively in the air and feeding entirely on aerial insects, especially nuptial swarms of beetles, ants, termites and native bees. Given the species is almost entirely aerial, it is unlikely to utilise habitats within the Study Area and, therefore, the proposed Action represents a low regional threat to the species (Ecologia 2010a). The species is unlikely to be significantly impacted by the proposed Action.

Eastern Osprey

The Eastern Osprey is a large, water-dependent bird of prey. In Australia the total range of the Eastern Osprey extends around the northern coast, extending from Esperance in WA to south-eastern NSW and the distribution around the coast appears to be continuous (Barrett *et al* 2003 and Johnstone & Storr 1998). The species is most abundant in northern Australia. The Eastern Osprey is rare to uncommon in southern Western Australia and small fragmented breeding populations exist in South Australia (Dennis 2007a). The species favours mangroves, rivers and estuaries, inshore seas and coastal islands and feeding on fish, sea snakes, seabirds and large lizards (Johnstone and Storr 1998).

The EPBC Protected Matters Search Tool did not indicate the presence of the species or its habitat within the Study Area; however, Eastern Ospreys were observed during both the December and May fauna surveys (Ecologia 2010a). In December, a single osprey was observed south of Coronation Beach (7 km to the northwest). During the May survey, an osprey was observed flying above the Limestone Ridge at Site 5 (Figure 8). Ospreys were also observed at Oakajee perched on high coastal dunes and foraging in near shore coastal waters. The species may roost within the Study Area, hunting in adjacent oceanic and coastal areas. No breeding activity or nests were found within the Study Area and the birds are thought to nest predominantly on islands (particularly the Houtman Abrolhos Islands) from late July to mid-October in the region (Johnstone and Storr 1998). Additionally, similar habitats to the north and south are present, with the Study Area not expected to be a critical hunting area for the species.

The species is generally uncommon on mainland coasts preferring offshore islands and therefore, the coast associated with the Study Area was not considered critical hunting habitat for the local population. Consequently, the proposed Action is not expected to significantly impact the local individuals observed.

Grey Plover

The Grey Plover is a medium sized Plover with a large head and heavy bill. It occurs along all coastal areas of Australia, and in Western Australia on some west-coast islands and near-coastal salt-lakes (Johnstone and Storr 1998). It is a migratory visitor to Western Australia, breeding in arctic Europe, Asia, and North America and wintering mainly south of the tropic of Cancer. In southern Western Australia, the Grey Plover is uncommon to moderately common and occurs mostly from September to April (Johnstone and Storr 1998).

The EPBC Protected Matters Search Tool did not indicate the presence of the species or its habitat within the Study Area, however the Grey Plover was recorded during the December 2006 survey, adjacent the Study Area, feeding and roosting on the beach between the Oakajee and Buller Rivers. The coastal habitats required by the Grey Plover are commonly found throughout Australia, including areas adjacent to the proposed Action. The species is unlikely to utilise the terrestrial habitats within the Study Area and therefore the proposed Action is not expected to significantly impact the species.

Dugong

Three Dugongs were sighted at Horrocks which was the northern extent of the baseline survey area (Oceanica 2010) approximately 55 km from the proposed Action. Dugongs are reported as being rarely seen in the Oakajee region, which is believed to be close to the most southern extent of their range (Tingay and Associates 1997). In addition, their preferred seagrass (*Halodule* and *Halophila*) food is not prevalent at Oakajee.

Dugongs are known to have very sensitive hearing, particularly to low frequency sounds and therefore may be very susceptible to loud noise. However, they are also known to react to underwater noise by fleeing the area and have exhibited aversion responses to divers and boats (Oceanica 2010). Given the lack of sightings in close proximity to the proposed port and the lack of significant feeding habitat in the area it is highly unlikely that the proposed Action will have any impact on this species.

3.1 (f) Commonwealth marine area

Description

The proposed Action will not impact upon any Commonwealth marine areas.

Nature and extent of likely impact

Not applicable

3.1 (g) Commonwealth land

Description

The proposed Action will not impact upon any Commonwealth land.

Nature and extent of likely impact

Not applicable

3.1 (h) The Great Barrier Reef Marine Park

Description

The proposed Action will not impact upon the Great Barrier Reef Marine Park.

Nature and extent of likely impact

Not applicable

3.2 Nuclear actions, actions taken by the Commonwealth (or Commonwealth agency), actions taken in a Commonwealth marine area, actions taken on Commonwealth land, or actions taken in the Great Barrier Reef Marine Park

3.2 (a)	Is the proposed Action a nuclear action?	X	No
			Yes (provide details below)

If yes, nature & extent of likely impact on the whole environment

3.2 (b)	Is the Proposed Action to be taken by the Commonwealth or a Commonwealth agency?	X	No
			Yes (provide details below)

If yes, nature & extent of likely impact on the whole environment

3.2 (c)	Is the Proposed Action to be taken in a Commonwealth marine area?	X	No
			Yes (provide details below)

If yes, nature & extent of likely impact on the whole environment (in addition to 3.1(f))

3.2 (d)	Is the Proposed Action to be taken on Commonwealth land?	X	No
			Yes (provide details below)

If yes, nature & extent of likely impact on the whole environment (in addition to 3.1(g))

3.2 (e)	Is the Proposed Action to be taken in the Great Barrier Reef Marine Park?	X	No
			Yes (provide details below)

If yes, nature & extent of likely impact on the whole environment (in addition to 3.1(h))

3.3 Other important features of the environment

3.3 (a) Flora and fauna

Flora

A total of 372 vascular flora taxa (including 43 naturalised alien taxa or weeds), from 74 families, was identified in the Study Area (Ecologia 2010b).

Conservation significant flora recorded within the Study Area to date include:

- *Eucalyptus blaxellii* (listed as Priority 4 by the WA DEC and Vulnerable under EPBC Act)
- *Lepidosperma sp.* Moresby Range (Priority 1 species (P1) listed by the WA Department of Environment and Conservation (DEC))
- *Melaleuca huttensis* (P1)
- *Thryptomene stenophylla* (P2)
- *Acanthocarpus parviflorus* (P3)
- *Beyeria cinerea subsp. cinerea* (P3)
- *Blackallia nudiflorai* (P3)
- *Calytrix pimeleoides* (P3)
- *Geleznovia verrucosa subsp. Kalbarri* (P3)
- *Grevillea triloba* (P3)
- *Verticordia densiflora var. roseostella* (P3)
- *Verticordia dichroma var. dichroma* (P3)

- *Triodia bromoides* (P4)
- *Verticordia penicillaris* (P4)

The proposed Action will only impact upon six species of conservation significant flora.

Fauna

The potential fauna assemblage of the Study Area was determined using the results of database searches and a review of surveys previously undertaken in the area (Ecologia 2010a). The potential terrestrial fauna assemblage of the Study Area comprises 22 mammal species, 161 bird species, 105 reptile species and 15 amphibian species.

In addition to the EPBC Act listed threatened and migratory species detailed in sections 3.1d and 3.1e, rare and endangered fauna in Western Australia are classified under the *Wildlife Conservation Act 1950* (WC Act). It recognises four distinct schedules. In addition, the DEC maintains a Threatened and Priority Fauna list which includes those removed from the WC Act and other species known from only a few populations or in need of monitoring. Five 'Priority' (P) codes are recognised.

There are three species of conservation significance that are considered to have a moderate likelihood of occurring within the Study Area:

- Western Carpet Python (*Morelia spilota imbricata*) – WC Act Schedule 4 and P4 species
- Australian Bustard (*Ardeotis australis*) – P4 species
- White-browed Babbler (*Pomatostomus superciliosus ashbyi*) – P4 species

Neither the Western Carpet Python nor the Australian Bustard were recorded within the Study Area during the Ecologia (2010a) vertebrate fauna survey. However these species have been recorded by farmers and freehold property owners and both have been recorded by fauna surveys in the vicinity of the Study Area (Ecologia 2010a).

The White-browed Babbler may have been recorded in the Ecologia (2010a) vertebrate fauna survey, but the subspecies (*Pomatostomus superciliosus ashbyi*) cannot be easily identified in the field. Given the distribution of the species however, and records of the bird in near proximity to the Study Area (Ecologia 2010a) it is possible that it may have been this subspecies that was recorded in the survey.

3.3 (b) Hydrology, including water flows

The Oakajee and Buller Rivers lie to the north and south of the proposed Action respectively. These rivers are ephemeral, but may flow for limited periods after heavy rain.

The Oakajee River rises in the Moresby Range approximately 10 km from the coast and has a contributing catchment area of approximately 35 km², which lies generally north and north east of the OIE. The Oakajee River has several tributaries that cross North West Coastal Highway in culverts, and join approximately 3 km east of the river mouth. The river discharges to the ocean from a meandering course through hilly terrain, approximately 4 km south of the Coronation Beach access road.

The Buller River also rises in the Moresby Range 5 to 6 km inland from the coast, and has a contributing catchment area of approximately 33 km², generally draining the area between the Moresby Range and North West Coastal Highway, east of the OIE. Two tributaries cross North West Coastal Highway in culverts, and combine approximately 2 km east of the mouth. The Buller River discharges from its meandering course to the ocean, approximately 3 km north of the suburb of Drummond Cove.

On the raised plateau which forms the bulk of the proposed OIE, the topography is rolling cleared farmland. Surface water generally infiltrates into the ground, and there are no incised surface water features or watercourses visible. Where surface water runoff is generated, this drains either to the Indian Ocean directly from the site (over the escarpment), or via the Oakajee or Buller Rivers to the north and south.

3.3 (c) Outstanding natural features

Not applicable.

3.3 (d) Remnant native vegetation

The proposed Action is located in the G.S. Biogeographic Region (Environment Australia 2007). The G.S. region is further subdivided into the Edel, Geraldton Hills and Lesueur Sandplain Subregions. The proposed Action occurs in the Geraldton Hills subregion (GS2). Remnant vegetation existing within this bioregion and mapped by Beard and Burns (1976) includes:

- Sparsely vegetated drift sand
- Banksia woodland and Acacia scrub
- *Acacia ligulata* open shrub
- Mixed (Melaleuca, Hakea) thicket
- Jam scrub (*Acacia acuminata*) with York Gum (*Eucalyptus loxophleba*).

A map showing regional remnant vegetation within an approximately 8 km buffer of the OIE is shown in Figure 9.

A total of 372 vascular flora taxa (including 43 naturalised alien taxa or weeds), from 74 families, was identified in the Study Area (Ecologia 2010b). The proposed Terrestrial Port Development does not include any Priority or Threatened Ecological Communities.

3.3 (e) Current state of the environment

The historical use of the land in the Study Area has been native vegetation and agricultural/pastoral. Most of the intact native vegetation at Oakajee occurs adjacent to the coastline and alongside the Oakajee and Buller Rivers. Smaller areas of fragmented native vegetation also occur among larger areas of cleared farmland. The majority of the sand plain area has been cleared in the past and is now used for pastoral purposes. The remaining areas with vegetation cover provide important habitats for vertebrates and invertebrates and range from poor to excellent condition according to the varying grazing and weed pressures. Grazing has degraded much of the native vegetation within the Study Area and the impacts of introduced predators and competitors are likely to have had a significant impact on native fauna populations (Ecologia 2010a).

Eight introduced mammal species were recorded in the Project area. Large numbers of European Red Fox (*Vulpes vulpes*), Feral Cat (*Felis catus*) and Rabbit (*Oryctolagus cuniculus*) were observed. Black Rat (*Rattus rattus*), Feral Pig (*Sus scrofa*), House Mouse (*Mus musculus*), Sheep (*Ovis aries*) and Cow (*Bos taurus*) were recorded within native vegetation at Oakajee. The high numbers of Feral Cat and European Red Fox observed likely contributed to the few small to medium size-range native mammals recorded during the survey. Two introduced bird species were recorded during the survey, Laughing Dove (*Streptopelia senegalensis*) and Rock Dove (*Columba livia*) (Ecologia 2010a).

Four declared weeds species listed under the *Agriculture and Related Resources Protection Act 1976* (ARRP Act) have been recorded during botanical surveys and include:

- *Carthamus lanatus* – Priority 1
- *Datura wrightii* – Priority 1/3
- *Echium plantagineum* – Priority 1
- *Tamarix aphylla* – Priority 1

Thirty-nine (39) invasive weed species were recorded within the Study Area during the flora and vegetation survey (Ecologia 2010b).

3.3 (f) Commonwealth Heritage Places or other places recognised as having heritage values

No Commonwealth heritage places exist on site. Several sites of non-indigenous locally significant heritage are located within the OIE Industry Buffer. These sites are summarised in Table 5 and presented in Figure 10.

Table 5: Non-Indigenous Heritage Sites

Heritage Site	Heritage Ref ¹	Description ²	Significance ²
White Peak Quarry	6355	Limestone quarry, probably first exploited in 1860's	Local and regional significance
White Peak townsite	Yet to be assessed		
Lime Kiln 1	6356	Brick-lined – undated, considered to be in use until 1952	Scientific significance
Lime Kiln 2	6357	Stone-walled	Local significance
Chinaman's House	6358	Two room stone cottage ruin, built in early 1920's.	Local significance
Cottage	6359	Ruins of a stone cottage, outbuildings and well, built circa 1900.	Local significance
Northampton – Geraldton Railway	N/A	Runs parallel to North West Coastal Highway, built to carry lead and copper from mines in Northampton to Geraldton Port, commenced operations in 1879. Rail now dismantled.	Not identified
Red Cliffs	N/A	Cottage and outbuildings - now been removed.	No longer present

Key – references:

1. Heritage Council of Western Australia, 2010
2. McDonald, Hales and Associates (2000)

3.3 (g) Indigenous heritage values

The proposed Action has the potential to impact upon a total of approximately 15 Department of Indigenous Affairs (DIA) registered sites respectively. These sites include the Oakajee and Buller Rivers, which are known to have mythological associations to local Aboriginal people. It is possible that unregistered sites of Aboriginal heritage also exist and ongoing heritage surveys may identify additional sites. The development of any site will require ongoing liaison with the DIA and Traditional Owners.

Figure 11 describes the proposed Action as it relates to registered sites of Aboriginal significance. Ongoing archaeological and anthropological surveys are underway to record the values within the proposed Action footprint. OPR has committed to continually consult with relevant indigenous groups during the design of the proposed Action and with respect to any future changes to the proposed Action footprint.

3.3 (h) Other important or unique values of the environment

The footprint of the proposed Action does not contain any Priority (PECs) or Threatened (TECs) Ecological Communities, nor does it intersect any national parks, conservation reserves or wetlands of national significance.

The Geraldton Hills subregion, of which the proposed Action is a part, has dry-land agriculture as the dominant land use (65.8%) together with grazing native pastures (13.2%). Of the smaller area consisting of conservation land, unallocated Crown land and Crown reserves (19.8%), over 68% of conservation estate in

the subregion is contained in Kalbarri National Park (approximately 100 km north of proposed Action). A further 20% of the subregion's conservation estate is contained in a single reserve, Wandana Nature Reserve (80 km NE of proposed Action), at the north-eastern periphery of the subregion. The remainder of the subregion has very few conservation reserves, the majority of which are small, threatened by salinity and on agriculturally unproductive land (Desmond and Chant, 2001). Reserves surrounding the proposed Action are shown in Figure 9.

3.3 (i) Tenure of the action area (eg freehold, leasehold)

The proposed Action is located within the OIE (approximately 2,328 ha) and its associated industry buffer zone which has been acquired in freehold by the State Government as part of its long term strategic planning process. In total these areas amount to approximately 6,400 ha. The desalination plant will be located within the disturbance footprint approved by Ministerial Statement 469 under the WA EP Act.

3.3 (j) Existing land/marine uses of area

The dominant land use in the Geraldton Hills subregion is dryland agriculture (65.8%) together with grazing native pastures (13.2%). Smaller areas consist of conservation land (13.2%) and unallocated Crown land (UCL) and Crown reserves (6.5%). Currently, the Project area is leased to several local farmers to continue grazing and agricultural purposes, or retained as remnant coastal vegetation.

3.3 (k) Any proposed land/marine uses of area

The remainder of the OIE not utilised for the proposed Action will be developed by the government and/or other industries at a later stage. The Oakajee to Narngulu Infrastructure Corridor proposed Action (approved by the State Minister for the Environment via Ministerial Statement 500 dated 8 March 1999) will link the Narngulu Industrial Estate south-east of Geraldton to the OIE and port facilities at Oakajee. The Oakajee to Narngulu Infrastructure Corridor includes provision for rail, power, communications and pipelines which will require the use of some remaining land within the OIE.

The proposed ODP will be undertaken in State waters (within 3 nautical miles [nm] off the coast) and on State land with some possible small vessel, ship traffic and marine mammal monitoring occurring (vessel and aircraft) in/over Commonwealth waters. All activities undertaken during the Project will need to comply with legislative requirements established under State and Commonwealth Government regulatory frameworks.

4 Measures to avoid or reduce impacts

Management measures to avoid or reduce impacts to matters of NES are primarily focussed on the only species identified in the impact assessment as having potential to be affected by the proposed Action is Carnaby's Black-Cockatoo (see below). Detailed design has however also focussed on minimising impacts to the coastal habitat zone (Table 6), which may be occasionally utilised by listed migratory bird species and also minimising impacts to marine fauna of National Environmental Significance (Table 7) (associated with desalination plant discharges to marine waters).

Table 6 Proposed management measures for impacts to terrestrial fauna

EMS Reference	Management Strategy	Phase	Responsibility
TCV23-24/TOV12	Prepare and implement an Emergency Management Plan to limit the risk of inadvertent fire ignition. The Emergency Management Plan will include controls regarding vehicle movement and maintenance, firebreaks, fire restrictions, fire fighting equipment, hot work procedures and training.	Construction and Operation	Safety Manager
TCV2/TCV6-9	<p>Clearing will be undertaken in accordance with the Flora and Vegetation MP (EMP-PORT-001), which includes the following measures:</p> <ul style="list-style-type: none"> • Implement a clearing control system to restrict the number and extent of cleared areas to the minimum needed for safe and efficient implementation of the project. The system shall include checks of clearing requirements, consistency with approvals, identification and exclusion of constraints, a communication and approval system that requires Management signoff, specifications for clearing and rehabilitation, checking and auditing • Vegetation clearing is to occur within clearly defined boundaries, and the area will be kept to the minimum required to safely perform the works • Off road traversing of vehicles will be prohibited unless authorised by the Site Environmental Manager • Pre-disturbed areas are used wherever possible for temporary infrastructure • Prepare and implement a policy of unauthorised access to constraint areas including areas of conservation significance or heritage value 	Construction	Construction Manager
TCV11/TCV13-16	<p>Prepare and implement a weed/pathogen control program to minimise the spread of weeds/pathogens into unaffected areas. The program will include the following:</p> <ul style="list-style-type: none"> • Assess the risk of spreading weeds/pathogens with all clearing and rehabilitation activities and restrict the movement of topsoil between sites where declared or significant weeds/pathogens could be spread to new locations • The assessments will continue on a regular basis and include reviews of hygiene controls and weed risks • Implement machinery hygiene procedures to manage the risks of weed/pathogen introduction and export to and from the site • All ground engaging equipment will be required to arrive on site clean of plant and soil material from other sites or hygiene work areas • Ground disturbance hygiene areas will include different hygiene work areas according to weed and pathogen risks • Vehicles will be inspected at random and contract clauses will ensure that equipment is compliant with the hygiene system. 	Construction	Construction Manager
TCV3 / TCF1	The survey information relating to location of conservation significant flora	Construction	Construction

EMS Reference	Management Strategy	Phase	Responsibility
	species adjacent to the proposed footprint will be included in OPR databases and documentation to ensure that OPR will not disturb listed species or their habitat beyond the approved disturbance areas.		Manager, Environment Manager
TCV25-34	<p>Prepare and implement a Flora and Vegetation MP (EMP-RAIL/PORT-001) / Conceptual Closure and Rehabilitation MP, which will include the following:</p> <ul style="list-style-type: none"> Records of the areas and prescriptions used for clearing and rehabilitation will be maintained in a separate Rehabilitation Register. Rehabilitation prescriptions for different vegetation types and soil types to include local native species with seed sourced locally where possible. Initial clearing will occur as close as practicable to first construction activities. Stockpiled vegetation and topsoil will be stored away from water courses and spread over disturbed areas that are no longer required. Rehabilitated areas will be constructed to blend in and allow suitable habitat for recolonising fauna. Topsoil management procedures will be developed and implemented to ensure that suitable topsoil and cleared vegetation is available for rehabilitation of cleared areas. The impact on active creek beds will be minimised and any additional construction areas will be rehabilitated as soon as practicable after construction. Salvage and store topsoil so that rehabilitation of construction areas can be completed in a timely, effective and efficient manner. Develop completion criteria and monitoring methods for the assessment of rehabilitation progress. 	Construction and Operation	Environment Manager, Construction Manager, Operations Manager
TCF7/TOF13	No domestic animals or pets will be permitted on site	Construction and Operation	Construction Manager, Operations Manager
TCF7/TOF14	<ul style="list-style-type: none"> Feral animals are not to be fed or sheltered. Feral animal controls at permanent site offices will include, trapping, fencing off areas, correct storage of putrescible wastes and appropriately covered bins. Observations of feral species will be reported to the Site Environmental Coordinator. 	Construction and Operation	Environmental Manager
TCV35/TCF18	<ul style="list-style-type: none"> Areas of foraging habitat disturbed for construction but not required for permanent infrastructure will be rehabilitated using suitable flora species for cockatoo feeding purposes. Species selection for rehabilitation and landscaping will include suitable tree species for cockatoo feeding purposes. 	Post-construction	Environmental Manager
TCF19	Implement the Oakajee Terrestrial Port Offsets Strategy (Appendix F) to avoid, minimise and offset potential impacts to Carnaby's Black Cockatoos.	Construction	Environmental Manager

Marine Fauna

The management strategies to ensure that the proposed Action does not impact upon marine fauna of NES through discharges of desalination plant brine to the marine environment include the modelling and monitoring of brine dilution in the marine environment. This program will be managed via the preparation and implementation of a Desalination Discharge Environmental Management Plan (DDEMP) (Appendix D) to

document modelling, monitoring and contingency requirements. Management strategies developed to minimise impacts to marine fauna of NES are summarised in Table 7.

Table 7 Proposed management measures for impacts to marine fauna

PER Reference	Management Strategy	Phase	Responsibility
MR1	A diffuser will be used to reach a minimum initial dilution of 30:1 within 30 m of the return-water discharge. The diffuser will have passive orifice control on the discharge jets to maximise mixing at low flow rates.	Design	Project Engineer
MR2	A DDEMP will be developed for construction and operational facilities. The DDEMP will provide details of the monitoring and management of the desalination brine discharge, which will include methods for the collection of physico-chemical water quality data within the LEPA and HEPA adjacent to the brine discharge. The program will capture seasonal variability including calm and stormy conditions and periods of significant river flow. The DDEMP will also include a process to respond to changes in production rates and management actions and responses to exceedances.	Design, Pre-construction	Project Engineer, Environmental Manager
MR3	Far-field modelling of brine discharge will be incorporated into the existing Oakajee hydrodynamic model developed for the Approved Port, prior to construction. A worst case scenario will be modelled based on low brine discharge velocity and a period (approximately 4 weeks) of calm meteorological and oceanographic conditions. The model will output a contour plot of dilutions with increasing distance from the diffuser to confirm the acceptability of the designated LEPA area (approximately 50m in all directions from the diffuser).	Pre-construction	Environmental Manager
MR4	Model verification study of the behaviour and dispersion of the plume (first 12 months after commencement of discharge), including: <ul style="list-style-type: none"> • Conductivity-Temperature-Depth (CTD) profiling surveys to establish the extent and intensity of the brine plume during calm conditions in the dry season (i.e. no river flow). The survey will include multiple sampling around the LEPA boundary; • Hind-cast modelling of the surveyed period with actual flows and weather conditions to confirm the accuracy of the model used in the assessment and the degree of any error in the prediction; • Sampling of pre-diluted discharge at the time of CTD surveys to provide accurate flow data as well as precise temperature, salinity, and metals (Al, Cd, Cr, Co, Cu, Pb, Mn, Hg, Ni, and Zn); and • Reporting the results to Office of EPA, with analysis of the degree to which the modelled behaviour of the plume was representative of the measured and any ramifications for management. 	Construction	Environmental Manager
MR5	Brine discharge monitoring, including: <ul style="list-style-type: none"> • Continuous discharge quality monitoring. During operations, both the ambient seawater and brine quality will be logged with data periodically downloaded and analysed to calculate average daily values for flow (m/s), temperature (°C), salinity (ppt); • Guideline values for in-line discharge parameters will be developed in consultation with the Office of the EPA. In the event of exceedance, the contingency management will be implemented. Salinity is the most critical value as this is the limiting parameter for which the diffuser has been designed; and • Monthly monitoring (ongoing) of bioavailable metals (Al, Cd, Cr, Co, Cu, Pb, Mn, Hg, Ni, and Zn) will be monitored within the discharge on a monthly basis and compared against guideline levels where appropriate. <p>No monitoring of toxicants at the boundary of the mixing is proposed due to</p>	Construction, Operation	Operations Manager, Environmental Manager

PER Reference	Management Strategy	Phase	Responsibility
	the well established technical issues (e.g. Wenziker et al. 2006). Therefore, concentrations of toxicants will be measured prior to discharge, the guideline values that would need to be met within the discharge in order to meet the High Protection EQG after the predicted dilution (estimated to be greater than 1:30) with seawater.		
MR6	Receiving environment monitoring: the overall Oakajee regional water and sediment quality will be assessed for environmental impacts associated with the port construction and operation. The details of these programs are outlined in the Water Quality Management Plan and the Sediment Quality Management Plan, which are currently being prepared to comply with MS 469 (i.e. the Approved Port).	Construction, Operation	Environmental Manager
MR7	<p>In the instance of trigger level exceedences:</p> <ul style="list-style-type: none"> Whole of Effluent Toxicity (WET) testing will be undertaken to investigate the potential toxicity of the discharge, and of the discharge diluted with clean, locally sourced seawater through the use of living test organisms. <p>The tests will be undertaken in accordance with the requirements of ANZECC/ARMCANZ (2000a), being for 5 species across 3 taxa, subject to review by the accredited testing laboratory (in the event that more appropriate tests have been developed); and</p> <ul style="list-style-type: none"> A program using deployed bivalves at impact and reference sites will be implemented if triggered by the discharge monitoring program and the results of WET testing show the potential for adverse impacts on fauna. Subsequent analysis of the concentrations of toxicants in the bivalve flesh will provide a measure of any potential threats to local fauna. <p>The EPA (2005c) recommends that “the median tissue concentration of chemicals that can adversely bioaccumulate or biomagnify should not exceed the 80th-percentile of tissue concentrations from a suitable reference site”. To assess the potential effects of bioaccumulating toxicants associated with the brine discharge, the median tissue concentrations of cadmium and mercury (i.e. the bioaccumulating metals) in bivalves deployed at sites located at the edge of the mixing zone, will be compared with the 80th percentile of tissue concentrations of mussels deployed at the reference sites.</p>	Construction, Operation	Environmental Manager

Carnaby’s Black-Cockatoo

Notwithstanding the above onsite management efforts proposed by OPR, and with the aim of minimising impacts to matters of National Environmental Significance in the Oakajee region, OPR are proposing to provide suitable offsets for any impacts to Carnaby’s Black-Cockatoo that may arise from the proposed action. It is recognised that although Carnaby’s Black-Cockatoo has not been recorded in the Study Area (Ecologia 2010a), some of the vegetation represents potential habitat for the species. Given the extent of similar habitat known regionally (as per GRFVS 2010), Carnaby’s Black-Cockatoo is likely to be an uncommon visitor to this region, and the species is not expected to breed in the area (Barrett *et al* 2003), the impact of the proposed Action on this species is not expected to be significant.

The key components of the approach to minimising impacts to Carnaby’s Black-Cockatoo are to:

- develop and implement strict clearing controls to ensure disturbance does not exceed that proposed in this referral;
- rehabilitate areas of foraging habitat disturbed for construction but not required for permanent infrastructure using suitable flora species for cockatoo feeding purposes;
- use suitable tree species for cockatoo feeding purposes in landscaping across OPR controlled sections of the OIE;
- support the conservation of retained habitat in OIE and surrounding industrial buffer;

- minimise location of lay down construction areas within potential habitat areas; and
- implement the Oakajee Terrestrial Port Offsets Strategy (Appendix F) to avoid, minimise and offset potential impacts to Carnaby's Black-Cockatoos.

Proposed mitigation measures

OPR is committed to providing dedicated local outcomes for the ongoing protection of key habitat and the recovery of Carnaby's Black-Cockatoo. Several mitigation and management measures are proposed to reduce impacts on matters of NES that may be potentially affected by the proposed Action. Mitigation is focussed on reducing any impacts associated with clearing of vegetation considered to be potential Carnaby's Black-Cockatoo habitat.

As part of the proposed Action, OPR commit to providing and implementing a suitable conservation offset package that compensates for the impacts of the development. OPR are also committed to rehabilitating and restoring areas on-site that incur ecological losses arising from construction activities.

Unavoidable biodiversity impacts from the proposed Action are being addressed through a systematic and scientific approach to offsetting. The Offsets Strategy (Appendix F) focuses on delivering a "maintain and improve" outcome to address the residual impacts of the proposed Action.

The key components (offset projects) of the Offsets Strategy are as follows:

- Oakajee River Valley Restoration Project (ORVRP)
- Coastal Remnant Vegetation Conservation Project (CRVCP)
- Moresby Range-Chapman Valley Habitat Conservation Project (MRCVHCP); and
- Carnaby's Black-Cockatoo Research (regional/local)

Section 4 of the Offsets Strategy (Appendix F) provides a complete summary and discussion of all mitigation measure proposed by OPR in relation to impacts on Carnaby's Black-Cockatoo.

A breakdown of mitigation measures proposed for impacts to Carnaby's Black-Cockatoo foraging habitat is detailed below in Table 8. Offsets proposed for mitigating impacts to breeding habitat are detailed in Table 9.

Table 8 Summary table of Carnaby's Black-Cockatoo foraging habitat offsets

COMPONENT	PROJECT	DESCRIPTION	AREA	OFFSET RATIO	OUTCOME
Restoration and rehabilitation of Carnaby's habitat in adjacent land	ORVRP	Includes rehabilitation of at least 10 ha of degraded land at the fringes of remnant riparian vegetation along the Oakajee River and adjacent to the Proposal area.	10 ha (within a 3km x 100m corridor)	0.2:1	The creation of Carnaby's Black-Cockatoo habitat adjacent to the Proposal area and enhancement of the local area as ecological stepping stone/ corridor linkage.
Acquisition and conservation of Carnaby's habitat off-site	CRVCP & MRCVHCP	Acquisition of approximately 330 ha of land supporting potential typical Carnaby's Black-Cockatoo foraging habitat north of Oakajee and inland of Moresby Ranges.	330 ha	5.8:1	Protection in perpetuity of high quality Carnaby's Black-Cockatoo habitat within the local area (within 60 km of the Proposal) along with associated vegetation.
Improved management of habitat	ORVRP, CRVCP & MRCVHCP	Improved management and monitoring of all habitat areas retained on-site to create, maintain and improve outcomes.	340 ha	N/A	Improved management and protection in perpetuity of important areas of vegetation for the Carnaby's Black-Cockatoo.
Carnaby's Black-Cockatoo research	RESEARCH	Research into Carnaby's Black-Cockatoo feeding requirements in region.	N/A	N/A	Increased local and regional knowledge and science relating to Carnaby's use of the Geraldton area vegetation.
Total			340 ha	6:1	

Table 9 Summary table of Carnaby’s Black-Cockatoo breeding habitat offsets

COMPONENT	PROJECT	DESCRIPTION	AREA	OFFSET RATIO	OUTCOME
Direct Offset					
Retention of Carnaby’s habitat in adjacent land	ORVRP	Riparian vegetation along the Oakajee river within a 3 km corridor will be retained and managed by OPR/LandCorp/Estate Manager in perpetuity.	6 ha (within a 3km x 100m corridor)	20:1	The retention of remnant habitat on-site to provide/retain suitable areas for ongoing use.
Restoration and rehabilitation of Carnaby’s habitat in adjacent land	ORVRP	Supplementary planting and enhancement of ecological value of riparian habitat.	6 ha <i>Included in above</i>	20:1 <i>Included in above</i>	The creation of a of Carnaby’s Black-Cockatoo habitat adjacent to the site and enhancement local area as ecological stepping stone/ corridor linkage.
Indirect Offset					
Improved management of habitat	ORVRP, CRVCP & MRCVHCP	Improved management and monitoring of all habitat areas retained to create, maintain and improve outcomes.	6 ha (within a 3km x 100m corridor)	N/A	Improved management and protection in perpetuity of areas of vegetation potentially used for breeding by Carnaby’s Black-Cockatoo.
Total			6 ha	20:1	

5 Conclusion on the likelihood of significant impacts

5.1 Do you THINK your proposed action is a controlled action?

- | | |
|-------------------------------------|---------------------------|
| <input checked="" type="checkbox"/> | No, complete section 5.2 |
| <input type="checkbox"/> | Yes, complete section 5.3 |

5.2 Proposed action IS NOT a controlled action.

The proponent considers that the proposed Action does not constitute a 'controlled action', as defined by the EPBC Act, in that it:

- does not have any potential to affect:
 - World Heritage Properties;
 - National Heritage Properties;
 - Ramsar Wetlands;
 - Threatened ecological communities; and/or
 - Commonwealth marine areas;
- is not a nuclear action;
- does not impact Commonwealth land; and
- is not being implemented by a Commonwealth agency.

A number of listed threatened and migratory species were identified as potentially occurring within the area. However, following an analysis of likely presence, Carnaby's Black Cockatoo is the only species considered to be relevant to this discussion.

It is recognised that although Carnaby's Black-Cockatoo has not been recorded in the proposed Action area, the species has been recorded near Oakajee and the proposed Action will affect some potential foraging and breeding habitat for the species. The proposed Action is expected to require clearing of up to 56.9 ha of potential foraging habitat (including 40.0 ha of *Melaleuca Grevillea* scrub containing moderately dense *G. argyrophylla* for which the actual foraging value at Oakajee is unknown). This habitat occurs in a few small remnants and is unlikely to be a major source of food for Carnaby's Black-Cockatoos, given their known distribution has been greatly reduced and they are not commonly spotted in the region.

No breeding populations are known in the Oakajee area and only seven potential breeding habitat trees have been identified within the proposed Action footprint. Clearance (0.3 ha) of the only vegetation association with a known potential to contain breeding habitat trees is limited to 0.3% of its known regional extent.

The loss of some of this potential breeding and foraging habitat is not expected to significantly impact on the species or warrant a controlled action because:

- The species was not observed within the development areas during field surveys, there are no existing records for the species within the development area and the species is not thought to be a common visitor to the local region.
- The species is not expected to breed in the area (Barrett *et al* 2003), based on breeding distribution; the closest recording of a breeding population near Oakajee was at Howatharra (10 km away) in 1983.
- The quality of much of the vegetation within the proposed Action footprint is low due to weeds and grazing.
- Predicted impacts to *Banksia* woodland (a vegetation type considered likely to have high foraging value to Carnaby's Black-Cockatoo) are limited to 1.8% of the known regional extent.

- The estimated impacts of the proposed Action include 40 ha of vegetation that is classified as potential foraging habitat based on the presence of *G. argyrophylla*, a species for which the actual foraging value at Oakajee is unknown (ELA 2010).

5.3 Proposed action IS a controlled action

Matters likely to be impacted

<input type="checkbox"/>	World Heritage values (sections 12 and 15A)
<input type="checkbox"/>	National Heritage places (sections 15B and 15C)
<input type="checkbox"/>	Wetlands of international importance (sections 16 and 17B)
<input type="checkbox"/>	Listed threatened species and communities (sections 18 and 18A)
<input type="checkbox"/>	Listed migratory species (sections 20 and 20A)
<input type="checkbox"/>	Protection of the environment from nuclear actions (sections 21 and 22A)
<input type="checkbox"/>	Commonwealth marine environment (sections 23 and 24A)
<input type="checkbox"/>	Great Barrier Reef Marine Park (sections 24B and 24C)
<input type="checkbox"/>	Protection of the environment from actions involving Commonwealth land (sections 26 and 27A)
<input type="checkbox"/>	Protection of the environment from Commonwealth actions (section 28)
<input type="checkbox"/>	Commonwealth Heritage places overseas (sections 27B and 27C)

6 Environmental record of the responsible party

	Yes	No
<p>6.1 Does the party taking the action have a satisfactory record of responsible environmental management?</p> <p>OPR has been appointed by the Government of Western Australia as the preferred developer of the Project.</p> <p>OPR is a joint venture between Mitsubishi Development Pty Ltd and Murchison Metals Ltd.</p> <p>Mitsubishi Development Pty Ltd is a subsidiary of Mitsubishi Corporation, Japan's largest general trading company. Mitsubishi Corporation handles a diverse range of products and services through its international business operations, managing environmental impacts and performance through an ISO 14001 compliant Environmental Management System. Mitsubishi strives to preserve and improve the global environment and pursue sustainable development through all aspects of their business activities.</p> <p>Murchison Metals Ltd and Mitsubishi Development Pty Ltd each have a 50 % share in Crossland Resources which is the owner of the Jack Hills iron ore project located in the mid-west region of Western Australia. The Jack Hills mining, transport and port operations are managed via a range of Environmental Improvement Plans and Environmental Management Plans. All Crossland staff and contractors are required to attend a comprehensive environmental induction to ensure adverse impacts to the environment are avoided.</p>	x	
<p>6.2 Has either (a) the party proposing to take the action, or (b) if a permit has been applied for in relation to the action, the person making the application - ever been subject to any proceedings under a Commonwealth, State or Territory law for the protection of the environment or the conservation and sustainable use of natural resources?</p> <p>If yes, provide details</p>		x
<p>6.3 If the party taking the action is a corporation, will the action be taken in accordance with the corporation's environmental policy and planning framework?</p>	x	

If yes, provide details of environmental policy and planning framework

Oakajee Port and Rail Pty Ltd (OPR) is creating a world class iron ore exporting logistics chain which will include a port, land-based iron-ore materials handling and storage infrastructure and a rail network. OPR is committed to environmental management, including ensuring compliance with environmental legislation and OPR commitments, but also to look “beyond compliance” management through continuous improvement measures.

Key principles of OPR's environmental policy include:

1. Compliance with all applicable legislative requirements and statutory obligations related to environmental management;
2. Developing an Environmental Management System (EMS) with regard to the guiding principles of AS/NZS ISO 14001;
3. Providing sufficient and suitable resources to implement and maintain the EMS;
4. Management to maintain, review and report on measurable objectives and targets to the Board and take actions to improve outcomes where targets are not achieved;
5. Minimise any negative impacts on the environment through appropriate planning, design, technology and training;
6. Taking all practicable measures to prevent pollution;
7. Minimise the use of raw materials, energy and water, and minimise the generation of wastes, through better work practices and education of OPR employees, consultants, contractors and infrastructure users;
8. Liaise with infrastructure users to identify and manage environmental aspects associated with their operations;
9. Communicate openly with the community, government and industry on environmental issues, predicting and acting on concerns regarding environmental matters;
10. Conduct regular environmental monitoring to ensure environmental management activities are achieving objectives and targets; and
11. Seek continual improvement in OPR's environmental performance through active identification and response to environmental issues.

Key responsibilities of OPR's Environmental Policy include:

12. The responsibility for developing, implementing, communicating, reviewing and maintaining the OPR Environmental Policy and Environmental Management System is with the Board and executive management team, of OPR and the Environmental Approvals Manager; and
13. All OPR employees and other persons working for or on behalf of OPR must commit to and work in accordance with this Environmental Policy and associated Environmental Management System.

6.4 Has the party taking the action previously referred an action under the EPBC Act, or been responsible for undertaking an action referred under the EPBC Act?

x

Provide name of proposed Action and EPBC reference number (if known)

OPR has prepared a separate EPBC Referral for the Oakajee Rail Development (2010/5500) which is considered to be a controlled action, and the ODP (2010/5760) which is currently being assessed.

7 Information sources and attachments

(For the information provided above)

7.1 References

Asia Pacific Applied Science Associates APASA (2010) Oakajee Desalination Discharge Modelling. Report provided as **Appendix B** to this Referral.

Barrett, G., Silcocks, A., Barry, S., Cunningham, R., and Poulter, R. 2003. The New Atlas of Australian Birds. Royal Australasian Ornithologists Union, Hawthorn East.

Beard, J.S. and Burns, A.C. 1976, The vegetation of the Geraldton area, Western Australia, Map and explanatory memoir, 1: 250,000 Series, Vegmap Publications, Perth, WA.

Birds Australia 2009, Birddata: Atlas of Australian Birds Database [online] available at: <http://www.birddata.com.au/>.

Chidlow, J., D. Gaughan & R. McAuley (2006). Identification of Western Australian Grey Nurse Shark Aggregation Sites. *Fisheries Research Report Number 155*. Western Australia: Department of Fisheries.

Consulting Environmental Engineers (2010) Concept Design for Desalination Plant Ocean Outfall. Report provided as **Appendix B** to this Referral.

Department of the Environment, Water, Heritage and the Arts (2010). Species Profile and Threats Database, Department of the Environment, Water, Heritage and the Arts, Canberra. Available from: <http://www.environment.gov.au/sprat>. Accessed Wed, 13 Oct 2010 14:14:07 +1100

Dames and Moore 1993, Flora & Fauna Assessment, Oakajee Proposed Industrial Site, Unpublished report for LandCorp Western Australia, WA.

Dennis, T. E. 2007a, Distribution and status of the Osprey (*Pandion haliaetus*) in South Australia, *Emu*, 107, 294-299.

Eco Logical Australia (ELA) (2010a) Carnaby's Black Cockatoo Habitat Assessment for Oakajee Terrestrial Port Development. Report provided as **Appendix C** to this Referral.

Eco Logical Australia (ELA) (2010b) Oakajee Terrestrial Port Development Offsets Strategy. Report provided as **Appendix F** to this Referral.

Ecologia 2010a, Oakajee Terrestrial Port Development: Terrestrial Vertebrate Fauna Assessment, Prepared for Oakajee Port and Rail, January 2010. Report provided as **Appendix A** to this Referral.

Ecologia 2010b, Oakajee Terrestrial Port Development: Flora and Vegetation Assessment, Prepared for Oakajee Port and Rail, February 2010. Report provided as **Appendix A** to this Referral.

Ecologia 2010c, Oakajee Terrestrial Port Development: Carnaby's Black Cockatoo Potential Habitat Mapping Report, Prepared for Oakajee Port and Rail, December 2010. Report provided as **Appendix C** to this Referral.

Environment Australia 2007, Interim Biogeographic Regionalisation for Australia (IBRA), [online] available at: <http://www.environment.gov.au/parks/nrs/ibra/index.html>

EPA 2005, Environmental Quality Criteria Reference Document for Cockburn Sound (2003- 2004) - A supporting document to the State Environmental (Cockburn Sound) Policy 2005, Prepared by Environmental Protection Authority, Report no. 20, Perth, Western Australia.

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Johnstone, R.E. & C. 2010, Carnaby's Cockatoo *Calyptorhynchus Latirostris* in the Geraldton Region, Prepared for Oakajee Port and Rail, July 2010.

Johnstone, R. E. and Storr, G. M. 1998, Handbook of Western Australian Birds, Volume I - Non-Passerines (Emu to Dollarbird), Western Australian Museum, Perth.

McDonald, Hales and Associates 2000, Heritage Management Plans: Oakajee Industrial Estate, Port Facility and Buffer Zone. Prepared for the Department of Resource Development.

Muir Environmental 1997, August 1997 reevaluation of flora and fauna: Oakajee proposed industrial estate and quarries. Unpublished report for the Department of Resources Development Western Australia, West Perth, WA.

Oceanica (2009) *Marine and Coastal Baseline Studies: Baseline Water Quality Monitoring Report (2006 to 2008)*. Draft report prepared for Oakajee Port and Rail.

Oceanica (2010) *Oakajee Port: Marine Mammal Baseline Investigation 2008 - 2009: Habitat Monitoring Report 2010*. Report prepared for Oakajee Port and Rail.

Tingay and Associates & Welker Environmental Consultancy (Tingay and Welker, 1997) *Oakajee Deepwater Port: Public Environmental Review*. Prepared for the Minister for Resources Development.

WAPC, 2010, Geraldton Regional Flora and Vegetation Survey. Western Australian Planning Commission, Perth. <http://www.planning.wa.gov.au/Plans+and+policies/Publications/2141.aspx>

7.2 Reliability and date of information

Information used in the preparation of this referral is based on a number of reports and studies developed to inform both the WA and Commonwealth approval processes. These studies have been undertaken by professional consultants who are expert in their respective fields. All scientific studies have been undertaken by expert ecologists with practical experience in surveying and monitoring.

7.3 Attachments

		✓ attached	Title of attachment(s)
You must attach	figures, maps or aerial photographs showing the project locality (section 1)	✓	Figures 1 and 2
	figures, maps or aerial photographs showing the location of the project in respect to any matters of national environmental significance or important features of the environments (section 3)	✓	Figures 6 and 7
If relevant, attach	copies of any state or local government approvals and consent conditions (section 2.3)		
	copies of any completed assessments to meet state or local government approvals and outcomes of public consultations, if available (section 2.4)	✓	Appendices A, B, C and D
	copies of any flora and fauna investigations	✓	Appendices A and C

and surveys (section 3)		
technical reports relevant to the assessment of impacts on protected matters and that support the arguments and conclusions in the referral (section 3 and 4)	✓	Appendix B
report(s) on any public consultations undertaken, including with Indigenous stakeholders (section 3)		

List of Figures

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- Figure 8: Migratory bird baseline survey observations
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List of Appendices

Appendix A: Baseline Flora and Fauna Surveys

- *Oakajee Terrestrial Port Development: Terrestrial Vertebrate Fauna Assessment*, Ecologia Environment (2010a)
- *Oakajee Terrestrial Port Development: Flora and Vegetation Assessment*, Ecologia Environment (2010b)

Appendix B: Desalination Outfall Modelling Studies:

- *Concept Design for Desalination Plant Ocean Outfall*, Consulting Environmental Engineers (2010)
- *Oakajee Desalination Discharge Modelling*, APASA (2010)

Appendix C: Targeted Carnaby's Black Cockatoo Habitat Assessments

- *Oakajee Terrestrial Port Development: Carnaby's Black Cockatoo Potential Habitat Mapping Report*, Ecologia (2010c)
- *Carnaby's Black Cockatoo Habitat Assessment for Oakajee Terrestrial Port Development*, Eco Logical Australia (2010a)

Appendix D: Relevant Environmental Management Plans

- Draft Construction Environmental Management Plan Flora and Vegetation Management
- Draft Operations Environmental Management Plan Flora and Vegetation Management
- Desalination Discharge Environmental Management Plan

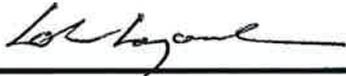
Appendix E: EPBC Protected Matters Search Results

Appendix F: Impact Mitigation and Offsets Package, Eco Logical Australia (2010b)

8 Contacts, signatures and declarations

Project title:

8.1 Person proposing to take action

Name John Langoulant
Title Chief Executive
Organisation Oakajee Port and Rail
ACN / ABN (if applicable)
Postal address PO Box 767, West Perth, 6872
Telephone 08 9486 0777
Email jlangoulant@opandr.com
Declaration I declare that the information contained in this form is, to my knowledge, true and not misleading. I agree to be the proponent for this action.
Signature  Date 20/12/2010.

8.2 Person preparing the referral information (if different from 8.1)

Name Damien McAlinden
Title Manager Environmental Approvals
ACN / ABN (if applicable) Oakajee Port and Rail
Postal address PO Box 767, West Perth, 6872
Telephone 08 9486 0777 or Mobile: 0488700209
Email dmcalinden@opandr.com
Declaration I declare that the information contained in this form is, to my knowledge, true and not misleading.
Signature  Date 20/12/2010
